



Sonar Head Deployment

The key to scanning sonar *imaging* operations is positioning the sonar head so the sound beam passes parallel over the imaged face – and – the head remains stable during the scan. As a general rule, profiling surveys require greater attention to grazing angles than imaging programs.



A simple horizontal bracket mount (upper left image) allows the operator to profile or vertically image a structure as does the more complex articulated arm below.



A bow mount (below left) can be used for shallow water, forward-looking scanning sonar or when the head is deployed in side-scan mode.

Photo courtesy *Peter Diving, Russia*

A tripod works best for bottom imaging when the seabed is relatively flat and the current is less than 3 knots (5.06'/sec, 1.5m/sec). Additional weight can be used for higher velocity current but may be limited by the method of recovery. In extremely soft sediment, larger footpads may be required..

Photo courtesy *C.H.Fenstermaker, Lafayette, LA*



Bow mounted scanning sonar head

Kongsberg Mesotech Ltd. Sonar Tripod





High-Current Deployment

As water velocity increases so does the need for design creativity of the deployment system. Making it bigger and heavier to withstand the flow stress is not always the best choice. These three deployment system examples maintain the head position in current speeds up to 9 knots (15.19'/sec, 4.6m/sec) . All were used to collect imaging and profiling data sets.



The *Port of Montreal* uses a man-rated lift to deploy an inverted mast with the scanning sonar head horizontally mounted at its base. The lift keeps the pole vertical but allows it to turn 90° in the horizontal plane. This lets the operator position the head to visualize the dock face and optimize the head position for profiling. The head remains stable in current flows up to 6.5 knots (10.9'/sec, 3.3m/sec).



Single RTK GPS antenna is now replaced with a dual antenna unit.

The geographic position of the Port of Montreal head is determined using a dual-antenna RTK GPS. This provides centimetre position accuracy, and pitch, roll and azimuth data.



Photo courtesy C.H.Fenstermaker, Lafayette, LA

Following Hurricane Katrina, bridge inspections were completed in New Orleans. Deployed from a barge, an inverted "Texas tower" was used to position the head (lower left tower and data images). A sonar inspection of the Kettle Valley Bridge (below) employed a pole mount where the head was kept in position using scaffolding poles and clamps fixed to the pier.



Substructural element of a bridge in New Orleans

Data courtesy C.H.Fenstermaker, Lafayette, LA

